

# Work Order ID 66960

Thursday, March 03, 2011 8:57:48 AM



Page 1

Item ID: D6104-003

Accept



Setup Start



Revision ID:

Stop



Item Name: Round Billet, 17-4

Start Date: 3/3/2011 Start Qty: 12.00



Cust Item ID:

Required Date: 3/17/2011 Req'd Qty: 12.00

Customer:

Reference:

Approvals: Process Plan: CZ Date: 11/03/03 Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr
D6104	Rev B

100 0.00



PURCHASING

Purchasing

Memo

0.00

Purchasing

Issue P/O: 13604 ☐ a) Description: S.S round billet ☐ b) Ø3.25" x 3.80" long ☐ c) Tolerance on all dimensions are +0.030"/-0.000" ☐ d) Material: 17-4PH Stainless steel (Ams 5643 or Aisi 630) ☐ e) One blank makes 2 parts ☐ f) Material certification required

CZ 11/03/03 (12)

110 0.00



Receive & Inspect for Damage & Mat'l Certs

Packaging

Memo

0.00

Packaging

Ensure material certification is attached

11/3/10 (12)

120 0.00



QC6- Inspect dimensions to drawing

QC

Memo

0.00

Quality Control

Ensure Material certification comply to Dwg D6104

11/03/10

12

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

**Work Order ID 66960**

Thursday, March 03, 2011 8:57:48 AM



Page 2

Item ID: D6104-003

Accept



Setup Start



Revision ID:

Stop



Item Name: Round Billet, 17-4

Start Date: 3/3/2011 Start Qty: 12.00



Cust Item ID:

Required Date: 3/17/2011 Req'd Qty: 12.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

130

Identify as per dwg & Stock Location: MATH6

0.00

SL 11/03/1612

Packaging

Memo

0.00

Packaging

140

QC21- Final Inspection - Work Order Release

0.00

11/3/17

QC

Memo

0.00

Quality Control

CZ 11/03/16

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

# Picklist Print

Page 1

Thursday, March 03, 2011 8:57:45 AM

Work Order ID: 66960



Parent Item: D6104-003



Parent Item Name: Round Billet, 17-4



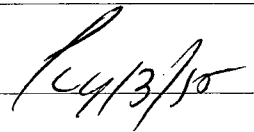
Start Date: 3/3/2011

Required Date: 3/17/2011

Start Qty: 12.00

Required Qty: 12.00

Comments: IPP B: ☐01.09.04 ☐Revised Step 2 SM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6104-003P  17-4 SS Roundbar 3.25"OD		Purchased	No			110	Each	0.0000	1 	12			

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

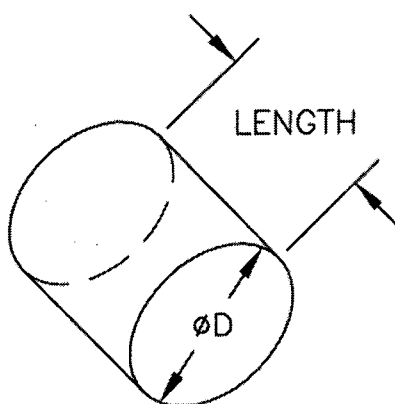


DESIGN RF	DRAWN BY <i>[Signature]</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D6104	Rev. B SHEET 1 OF 1
DATE 02.11.25		TITLE ROUND BILLET, 17-4	SCALE NTS
A	01.04.10	NEW ISSUE	
B	02.11.25	CLARIFY ALLOY SPEC ADDED D6104-009/-011 REDUCE LENGTH OF BILLETS	

RELEASED

02.11.29 *[Signature]*

## SPECIFICATION CONTROL DRAWING



C/L 11/03/03  
W/D: 66960

MATERIAL: 17-4 PH SS (AMS 5643 OR AISI 630) MIN UTS = 170 KSI (38 HRc)

PURCHASE MATERIAL ACCORDING TO THE FOLLOWING TABLE. SPECIFY ALLOY, DIAMETER x LENGTH (+0.030/-0.000) AS SHOWN.

TOLERANCE ON ALL DIMENSIONS IS +0.030/-0.000.

ALL DIMENSIONS ARE IN INCHES

Part No.	Alloy	D (Diameter)	Length
D6104-001	17-4 PH STAINLESS STEEL	Ø3.00	3.80
D6104-003	17-4 PH STAINLESS STEEL	Ø3.25	3.80
D6104-005	17-4 PH STAINLESS STEEL	Ø4.00	5.10
D6104-007	17-4 PH STAINLESS STEEL	Ø4.50	5.10
D6104-009	17-4 PH STAINLESS STEEL	Ø5.25	4.10
D6104-011	17-4 PH STAINLESS STEEL	Ø6.50	4.10

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Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

## PURCHASE ORDER

Purchase Order ID **PO13604**

Purchase Order Date 3/3/2011

PO Print Date 3/3/2011

Page Number 2 of 3

Order From :

VC-MET001

METAUX CASTLE  
A.M. CASTLE & CO. (CANADA) INC. - BOX B9204 PO BOX 9100  
TORONTO, ON M4Y 3A5  
CA

Contact Name

Buyer

Chantal Lavoie

Vendor Phone

514 694 9575

Requisition Nbr

Vendor Fax

514 695 3281

Tax Resale Nbr

10127-2607

Vendor Account Nbr

Terms

Net 30

Currency

CAD

FOB

Destination-Collect

3	D6101-005P	7075-T7351 8.25X5.0X2.5	3/7/2011	✓	30.00	Yours ppd	\$61.0000	\$1,830.00
			Yes		Each			

Special Inst:

AS PER DWG D6101 REV. B  
B66966  
MATERIAL: ALUMINUM BILLET 7075-  
T7351 (QQ-A-250/12)  
SIZE: 5.00" X 8.25" X 2.50" THICK  
TOLERANCE ON LENGTH ARE  
+0.030"/+/-0.000"  
GRAIN DIRECTION ALONG 5.00"  
LENGTH

4	D6101-007P	7075-T7351 8.25X7.75X2.5	3/7/2011	✓	30.00	Yours ppd	\$79.2500	\$2,377.50
			Yes		Each			

Special Inst:

AS PER DWG D6101 REV. B  
B66967  
MATERIAL: ALUMINUM BILLET 7075-  
T7351 (QQ-A-250/12)  
SIZE: 7.750" X 8.250" X 2.50" THICK  
TOLERANCE ON LENGTH ARE  
+0.030"/+/-0.000"  
GRAIN DIRECTION ALONG 7.750"  
LENGTH

5	D6104-003P	17-4 SS Roundbar 3.25"OD	3/17/2011		12.00	Yours ppd	\$48.6300	\$583.56
			Yes		Each			

No substitution or deviation without  
consent.  
Certificate of Conformity or Material  
Certification required when applicable

Change Nbr: 1

Change Date: 3/3/2011





Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

## PURCHASE ORDER

Purchase Order ID PO13604

Purchase Order Date 3/3/2011

PO Print Date 3/3/2011

Page Number 3 of 3

Order From :

VC-MET001

METAUX CASTLE  
A.M. CASTLE & CO. (CANADA) INC. - BOX B9204 PO BOX 9100  
TORONTO, ON M4Y 3A5  
CA

Contact Name

Buyer

Chantal Lavoie

Vendor Phone

514 694 9575

Requisition Nbr

Vendor Fax

514 695 3281

Tax Resale Nbr

10127-2607

Vendor Account Nbr

Terms

Net 30

Currency

CAD

FOB

Destination-Collect

Special Inst:

AS PER DWG D6104 REV. B  
B66965  
MATERIAL: 17-4PH STAINLESS STEEL  
AS PER (AMS 5643 OR AISI 630)  
SIZE: 3.25" X 3.80" LONG  
TOLERANCE ON ALL DIMENSION ARE  
+0.030"/-0.000

PO Total:

\$6,876.26



Change Nbr: 1

Change Date: 3/3/2011

No substitution or deviation without  
consent.  
Certificate of Conformity or Material  
Certification required when applicable

**Castle Metals®**

A. M. Castle &amp; Co.

**PACKING SLIP**

Page 1 of 1

Shipment No:723819

<b>Ship From:</b> Castle Metals MONTREAL 835-SELKIRK AVENUE POINTE CLAIRE, QUEBEC H9R 3S2		<b>Sold To:</b> DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7		<b>Ship To:</b> DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7		<b>Deliver To:</b> DART AEROSPACE LTD 1270 ABERDEEN HAWKESBURY, ON K6A 1K7 CA	
<b>Date Shipped</b> 14-MAR-11	<b>F.O.B.</b> ORIGIN	<b>Freight Terms</b> Prepaid		<b>Carrier</b> MANITOULIN		<b>BOL No</b> 723819-2	

<b>Shipment Details</b>	<b>Final Destination Branch - MON</b>
-------------------------	---------------------------------------

<b>Order No</b> 1320106	<b>Line No</b> 1	<b>Item No</b> 42470.MO	<b>Description</b> 3.2500.RD.17CR-4NI.STAINLESS.RT.SOL TR.COND A.132.0000-156.0000 CUT TO 3.8 IN ( + .1250/- .0000 IN) - BAND SAW CUTTING SPECIFICATIONS: AMS 5643				
<b>Purchase Order No</b> 13604		<b>Part Number</b> YOUR ITEM NUMBER: D6104-003		<b>Ordered Qty</b> 12 PCS		<b>Invoice Qty</b> 12 PCS	
<b>Details</b>							
<b>Delivery No.</b> 72621336	<b>Mill</b>	<b>Heat Number</b> G16708	<b>Mech Id</b>	<b>PCS</b> 12	<b>Width (IN)</b>	<b>Length (IN)</b>	<b>Shipped Qty (LBS)</b> 107.2

These commodities/technologies are subject to US Export Administration & US State Dept. Regulations and, if intended for export, were/are exported thereunder. Diversion contrary to US Law is Prohibited.

We hereby certify the material covered by this certification conforms in accordance with the above specifications and has been found to meet the applicable requirements for the material, including any specifications forming a part of the description. Test reports are on file subject to examination. All claims for defective material are waived unless made in writing to A.M. Castle & Co. within 60 days of the shipment. Material cut to the correct size, or material cut by the customer cannot be returned for credit.

Reviewed by Authorized Castle Metals Representative:

Date:

*AK* 11/03/16

Castle Metals FP

HEAT NUMBER G16708  
MECHANICAL ID 43470  
ITEM CODE \_\_\_\_\_  
LOT NUMBER 60231  
PO NUMBER \_\_\_\_\_  
RECEIPT DATE 10-15-2016  
SUPPLIER Q&T0 KAMPA  
SPECIFICATION \_\_\_\_\_  
LCS NU  
COMMENT \_\_\_\_\_  
APPROVED BT

*Conf*  
11/03/16



# Certificate of Test

HEAT G16708

ORDER 614108/ 02 BOL 0209093 \* CERTIFICATION \* 10/13/10

SHIP TO:  
A. M. CASTLE METALS  
3400 NORTH WOLF ROAD

FRANKLIN PARK

601310000

60221

YOUR ORDER & DATE  
10/13/10 CUST# 0254001 CUST TAG#42470

ITEM DESCRIPTION  
GRADE 17-4 Ship Condition CONDA  
Size 17-4 RND HRART CONDA 3.2500 x 144.000 RL  
Country of Melt: UNITED STATES Country of Mfg.: UNITED STATES  
NAFTA Country of Origin is Country of Melt

No weld repair  
Free of mercury contamination, Free of radiation contamination  
No WEEE relevant substances; Meets EU electrical ROHS

Total Bundles 1 Total Weight 1972

WO 2014476 Bundles: 1J

SPECIFICATIONS  
THE PRODUCTS LISTED ON THIS MILL TEST REPORT SATISFY PREFERENCE CRITERION B  
AS DEFINED IN ARTICLE 401 OF THE NORTH AMERICAN FREE TRADE AGREEMENT.  
AMS 2303E AMS 5643R  
ASME SA182 E07, A07-09, E10 ASME SA564 E10  
ASTM A434-09 ASTM A564 04 Type 630  
DFARS 252.225.7014 6/05 Reduction Ratio 3:1 minimum  
UNS S17400, AISI 630 No weld repair  
Free of Mercury Contaminatio AM Castle 3174-10 R8  
H900 CAPABILITY SAMPLE AGED AT 900F/1HR/AC THEN TENSILE AND HRC TESTED

MECHANICAL & OTHER TESTS  
Hardness as shipped 327 HB Hardness as tested 421 HB  
Hardness as shipped 035 HRC Hardness as tested ( 45 HRC )  
Grain size 5.0 Tensile strength, KSI (MPa) 206.0 (1420)  
Micro OK 0.2% Yield Strngth, KSI (MPa) 181.5 (1251)  
Intergranular corrosion OK Elongation % in 4D 13.5  
Macro Reduction of area % 45.3  
Charpy (ft lb) 0 0 0 Avg 95  
Ferrite .0

CHEMICAL COMPOSITION  
Carbon (C) .030 Manganese (Mn) .870  
Phosphorus (P) .022 Sulphur (S) .026  
Silicon (Si) .350 Chromium (Cr) 15.470  
Nickel (Ni) 4.230 Cobalt (Co) .050  
Copper (Cu) 3.830 Moly (Mo) .400  
Nitrogen (N) .029 Columbium (Cb) .280  
Titanium (Ti) .010 Aluminum (Al) .010  
Tin (Sn) .005 Boron (B) .003  
Tantalum (Ta) .010 Vanadium (V) .120  
Columbium/ Tantalum (Cb+Ta) .281  
Iron (Fe) Balance  
Frequency .000 Severity .000  
Melt Practice EAF  
Refining Practice AOD  
De-long Ferrite

Knowingly & willfully falsifying or concealing a material act on this form,  
or making false, fictitious or fraudulent statements or representations  
herein could constitute a felony punishable under federal statutes.  
We hereby certify that the test results shown in this report are correct and  
accurate as contained in the records of the company and are in compliance  
with the specifications, codes, and standards listed above.

M.F. Marcanio, Quality Manager

*M.F. Marcanio*